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The Need for Self-Propelled Mortars

by

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The highly important question of the need for self-propelled artillery already has been raised in periodical military publications.* In the interests of increasing the combat effectiveness of our Ground Forces we believe it necessary, along with developing self-propelled artillery, to develop self-propelled mortars as well. Without them, in the near future the artillery of motorized rifle, and especially tank, large units will not, in our opinion, be able to fully meet the requirements of a combined-arms battle and perform all its fire tasks to the full extent in the shortest possible time with the minimum expenditure of ammunition and by the most economical methods.

The attention given to artillery, and especially mortars, has decreased in recent years as the troops have been equipped with tactical nuclear weapons. In the postwar period the number of mortars in Ground Forces large units already has been sharply reduced. Thus, according to 1942 tables of organization and equipment, a rifle division had 104 mortars (not counting 50-mm mortars), which assured it superiority over a German infantry division by a factor of 1.5 in 82-mm mortars, and absolute superiority in 120-mm mortars. At the present time there are 15 mortars in a tank division, and 45 in a motorized rifle division. This is one-half to one-third the number of mortars in large units of the armies of the US and the Federal Republic of Germany. Even if mortars are considered obsolete weapons, such a significant enemy superiority cannot be tolerated, if only because mortars are the sole weapon able to fully combat other mortars.

It is known that mortars were first used in 1904 in defense of Port Arthur. Then they were forgotten, and by 1914 there were virtually none in the Russian Army. In the World I period mortars again demonstrated their right to existence as close combat weapons. It is sufficient to recall that in the offensive against Riga in September 1917, the Germans concentrated 550 mortars on a 4.5 kilometer front; and that the French during the Aisne River offensive in April 1917 had 1,650 mortars, which at that time represented considerable strength.

Despite the obvious need to develop this type of weapon, mortars were not adopted into service in the Red Army until 1937-1938, and by February 1940 the troops had received only about 6,800 in all. Only the experience of the war with the White Finns revealed this serious shortcoming and necessitated the acceleration of the equipping of the army with mortars. As a result, by April 1940 there already were 10,800 mortars with the troops (not counting 50-mm mortars). However, even this number proved to be clearly insufficient. On the basis of the experience of the first months of the Great Patriotic War, a decision was made to increase the production of mortars. In September 1941 industry produced three times as many of them as in July, and by November 1942 the production of mortars had increased 10.2 times. Of the total number of guns in the Ground Forces (including antiaircraft, self-propelled and rocket artillery), mortars comprised 46.6 percent in 1943, and 37 percent in 1945. The Great Patriotic War ended in victory, and again the number of mortars with the troops began to be reduced; the above-cited figures provide a convincing illustration of this.

At present the majority of the armies of the capitalist states have self-propelled mortars in service. For example, the US Army has the M257E1 81-mm self-propelled mortars on M113 armored personnel carrier chassis, and the M48, XM106 and M106E1 106.7-mm (107-mm) self-propelled mortars. In the army of the Federal Republic of Germany, 81-mm and 120-mm self-propelled mortars have been adopted into service. The Japanese army has 61-mm and 106-mm self-propelled mortars developed from American models but manufactured in Japan. At the same time mortar rounds also are being improved. Thus, in the US Army the new M374 81-mm round has been developed with a more powerful explosive charge and a perlite wrought iron casing, which doubles its effectiveness. The range of fire using this round has been increased considerably by improving the obturation and aerodynamic characteristics of the round. Work also is being done to increase the power and range of fire of mortars using 107-mm rounds. The great attention to mortar armament is explained by the advantages inherent in mortars in comparison to other fire means.

At the present time there are no self-propelled mortars in our Ground Forces. It often is written in the military press that the insufficient amount of artillery and mortars in Ground Forces large units is compensated for by the large number of tanks, the gun armament of which can successfully substitute for artillery and mortars. However, it must not be forgotten that tanks are primarily intended for combat against enemy armored targets. Tank armament and instrumentation are being improved for that very purpose. The unit of fire of tank guns basically consists of

armor-piercing and sabot rounds, which are not sufficiently effective when fired at non-armored targets.

But mortars, unlike howitzers and especially tank guns, are capable of striking targets behind shelters and in ravines, folds in the ground and wooded areas. When one 82-mm to 120-mm mortar round bursts, enemy personnel located in the open are killed within a 1,000 to 1,570 square meter area; whereas the shell of a 100-mm tank gun kills personnel within an area of no more than 400 square meters. That being the case, a 100-mm tank round costs two to three times as much as a mortar round.

Thus, from an economic point of view, it is six to nine times more profitable to destroy enemy personnel located in the open by mortar fire than by tank gunfire. In addition, a self-propelled mortar can carry up to 120 to 200 rounds in its fighting compartment, while a tank carries only 20 high-explosive fragmentation shells. Consequently, when striking personnel in shelters, the firepower of the expendable reserve of ammunition carried in the fighting compartment of a self-propelled mortar is 23 to 25 times that of a tank.

This suggests the conclusion that it is not advisable to destroy by tank gunfire those targets which may be more successfully destroyed by mortar fire. The number of such targets in the various types of battles fluctuates between 20 and 60 percent. Consequently, tank units and large units in the first echelon should have at least one self-propelled mortar for every five tanks. These mortars will perform tasks which are impossible for tank guns to perform: destroying the enemy with chemical weapons, blanketing individual targets with smoke, setting up smoke screens and light markers, and illuminating the terrain.

In comparing self-propelled mortars and self-propelled artillery, it is easily observed that mortar rounds, when fired against personnel located in the open, are capable of destroying targets over a considerably greater area than artillery shells of corresponding caliber, and are not inferior to such shells in killing personnel in shelters. The size (in square meters) of this zone in which personnel are killed by fragments and the shock wave is shown in the following table.

Nature of target	120-mm mortar round	122-mm shell	160-mm mortar round	152-mm shell
Personnel standing up in the open	1,570	800	2,270	950
Personnel lying down	740	310	860	360
Personnel in foxholes	30	30	65	50

For personnel of the attacking troops who are in the open, the safe distance from the targets to be hit by mortar fire is approximately half that required when these targets are to be hit by artillery. When there is accompanying fire from tanks and infantry combat vehicles, mortars in fact can destroy the enemy personnel and antitank means immediately in front of those attacking tanks and infantry combat vehicles located on the flanks and between subunits. This is of great importance in close combat and especially during combat actions conducted without the employment of nuclear weapons.

Mortar rounds are much lighter in weight than tank and artillery rounds. Thus, 960 82-mm mortar rounds, or only 144 100-mm artillery shells can be supplied to the troops by two three-ton trucks or one MI-6 helicopter. This makes it possible to have much larger mobile reserves without increasing the number of transport means and facilitates the delivery of ammunition during an operation, which is especially important for troops separated from the main forces and supply bases.

The production and operation of self-propelled mortars is much simpler, and the cost significantly less, than that of self-propelled artillery. The cost of manufacturing mortar rounds is two to 2.5 times less than the cost of artillery shells of comparable calibers.

Thus, using tanks, as some authors propose, to perform fire tasks usually performed by mortars, is unprofitable and inadvisable in terms of firepower, tactical features and economic considerations.

On the basis of the foregoing we again emphasize that, along with self-propelled artillery, motorized rifle and especially tank divisions should also have self-propelled mortars.

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It is organizationally more advantageous, in our opinion, for self-propelled mortars to be formed into regiments of armies and separate battalions of tank and motorized rifle divisions. That being the case, the mortars will not be held in reserve in second-echelon units and subunits; they may easily be transferred to the axes requiring them.

In an army self-propelled mortar regiment there may be two battalions of three six-mortar batteries each (36 mortars in a regiment). It is most desirable for them to have 120-mm and 160-mm mortars. The mortar battalion of a division may consist of three batteries with six 120-mm or 82-mm mortars each. With this number of mortars, divisions advancing along the main axis of the army will be able to reinforce first-echelon battalions with self-propelled mortar batteries, which will greatly increase their firepower.

Self-propelled mortars, when relocated immediately behind first-echelon subunits, will destroy with their fire the enemy antitank and other fire means in front of the attacking troops. Self-propelled artillery in this instance, by using its maximum range, will be able to concentrate fire against artillery and other targets in the depth, while tanks will concentrate their fire against armored targets. As a result, in the course of the battle all the fire means will be aimed just at those targets they were built to destroy with maximum effectiveness, economically and reliably.

In destroying antitank means, self-propelled mortars sharply reduce tank losses, and the tank crews, attacking right after the rounds explode, will operate more confidently and decisively while saving their limited unit of fire for the most important targets. The capabilities of motorized infantry also will increase due to the inclusion of self-propelled mortars with their high-trajectory fire, which aids in killing enemy personnel. All this will result in a considerable increase in the rates of advance of the Ground Forces, and will ensure that their tasks are carried out in a shorter time and with fewer losses.

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